SAMPLING AND ANALYTICAL RESULTS
BARITE HILL MINERALIZED ZONE
SEPTEMBER 1998

Prepared By
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October 12, 1998

SCDHEC
Bureau of Water
Water Enforcement Division
2600 Bull Street
Columbia, SC. 29201
Attn: Robin Foy

Re: Barite Hill Project
Consent Order #98-049-W - Requirement 3; Quarterly Reports

Dear Mr. Foy,

Enclosed are two copies of the 1998 third quarter report outlining reclamation activities performed on the "mineralized" zone at the Barite Hill Project. I have also sent a copy of the soil sampling report to Craig Kennedy for his review.

If you have any questions, please contact me at (864) 443-2222.

Sincerely,

Scott A Wilkinson
Project Manager

CC: Mike Kolin; Chief Operating Officer

Frank Filas; Corporate Environmental Manager

Enclosures

File: scdhecrf100598

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1.0 INTRODUCTION

The Barite Hill Mineralized Zone is located along a northeast to southwest ridge line that bisects the Barite Hill Mine site. During active mine operations, the Mineralized Zone encompassed the ore stockpile area, crusher area, reusable pad area, and Rainsford haul road. Although the mineralized zone was reclaimed in 1995, surface water runoff from the area, as monitored at NPDES Outfall 001, has periodically exhibited depressed pH levels and elevated concentrations of copper and zinc. These surface water impacts are attributable to three potential sources: (1) residual sulfide contamination from ore stockpiling, crushing, and transporting operations, (2) surface exposure of natural soils and bedrock containing elevated sulfide levels, and (3) excessive erosion of cover soils containing lower sulfide levels.

Nevada Goldfields Inc. (Nevada Goldfields), in accordance with the South Carolina Department of Health and Environmental Control's (SCDHEC's) Consent Order 98-049-W, submitted the "Long-Term Reclamation Plan for the Mineralized Zone" (Reclamation Plan) in July 1998 and addendum to the plan in August, 1998. The Reclamation Plan includes an initial sampling and analysis of the soil and rock in the mineralized zone to identify potential contaminant source areas and determine appropriate mitigation measures for these source areas. The results of this sampling and analysis program are presented in this report.

2.0 SAMPLE COLLECTION

Samples were collected over the 11 acre area shown in yellow on Figure 1. This sample area encompasses the top and sides of the ridge and those areas most impacted by mine operations including the ore stockpile area, crusher area, reusable leach pad, and Rainsford haul road. Based on visual observations and drainage considerations, the surrounding areas were determined to have little, if any, significant impact on surface water quality. These surrounding areas included:

1. The access road to the plant site which is covered with a thick layer of lime.
2. The area between the sample area and the plant access road which is covered with a good growth of pine trees.
3. The low area between the sample area and the permanent leach pad which is densely vegetated and only minimally disturbed by previous mining activities.
4. The densely vegetated area between the reclaimed Rainsford Pit and the Rainsford Haul Road (note: a sample was, however, collected from a rock outcrop located within this area).
5. The area between the former reusable pad area and the plant site.

As shown on Figure 1, a 26 point sample collection grid was laid out over the sample area. The sample grid is on 200 foot by 200 foot centers in areas supporting good vegetative growth and closer centers in suspected source areas such as the former crusher area. In addition, three sample locations (RCK 1, RCK 2 and RCK 3) were selected within rock outcrops in the Mineralized Zone and one representative sample location (CC) was selected in the clay cover borrow area east of the Mineralized Zone. Based on a total of 29 sample locations in the 11 acre sampling area, an average of one sample location was established every 0.4 acre.

Four soil samples were collected at each of the 26 grid locations and the clay cover borrow area; the first sample from 0 to 6 inches (surface), the second sample from 9 to 15

inches (one-foot deep), the third sample from 21 to 27 inches (two-feet deep), and the fourth from equal parts of the first three samples (composite). Initially the samples were collected using a post-hole digger and a trowel. However, this method proved to be time consuming and inefficient due to the compacted nature of the clay soil and the close proximity of bedrock to the surface at most locations (i.e., typically at a depth of two feet or less). The majority of the samples were subsequently collected by excavating a shallow trench with a backhoe and scraping the soil from the sides of the trench using a trowel.

The vegetation type and condition (i.e. sparse, medium or dense growth) were recorded at each of the soil sample locations. Soil samples were classified according to the unified soil classification system which includes the color, texture, and other observable physical properties of the soil. Soil pH measurements were also taken of each of the three depths sampled by mixing equal volumes of soil and distilled water (pH = 5.5) together and measuring the resulting solution with a field pH probe.

Rock samples were collected from each of the three exposed bedrock outcrops within the Mineralized Zone. These outcrop areas included (1) the rock slope immediately east of the reusable pad and south of the plant access road, (2) the rock wall east and south of the crusher area, and (3) the relatively flat rock surface near the reclaimed Rainsford Pit.

Rock samples collected from the three outcrop areas and the subcrop areas encountered in the grid sample locations were categorized according to rock type and mineralogy. The site geology generally consists of an upper layer of saprolite, a middle layer of weathered bedrock, and a lower layer of competent bedrock. Saprolite, which is the most commonly observed rock at the site, is extremely weathered rock that has been broken down to clayey soil while retaining some of the original rock structure. Bedrock generally consists of partially metamorphosed sediments (metasediments) with inclusions of greenschist and felsic volcanics.

3.0 SAMPLING AND ANALYTICAL RESULTS

The sampling and analytical results can be divided into the following three categories.

1. **Field Results** consisting of vegetation, soil and rock descriptions and soil pH measurements made at the site.

2. **Agricultural Soil Testing** of surface samples to determine the critical vegetative growth parameters of the soil and recommended soil amendments.

3. **Acid Neutralization and Generation Potential (ANP and AGP) Testing** of composite samples to identify soils and rock which are unsuitable for long-term reclamation of the Mineralized Zone.

The sampling and test results for each category are presented in Appendices A, B and C, respectively. A summary of the results is provided below.

3.1 FIELD RESULTS

The following summary of the field sampling and analysis program is based on the vegetative growth, soil and rock descriptions, and pH measurements recorded in Appendix A. The summary includes a review of background conditions, typical soil and rock conditions within the Mineralized Zone, and those areas where mining activities have significantly altered soil and rock conditions.

3.1.1 Background Conditions

One of the first objectives of the field program was to identify background conditions for the site that could be used as a yardstick in evaluating the post-mining soil and rock

characteristics of the Mineralized Zone. Sample Locations CC and 21 were utilized for this purpose.

Sample Location CC is in the clay cover borrow area east of the Mineralized Zone. The three samples collected in this area (Samples CC A, CC B, and CC C) were of yellow, brown, and red gravely clay with soil pH values between 4.7 and 5.2.

Sample Location 21 is located on the side of a hill between the Rainsford Road and the Reusable Leach Pad and, based on its intact lithology and site history, appears to be representative of the original soil conditions within the Mineralized Zone. Samples collected at Location 21 consisted of an upper brown silt layer with a soil pH of 4.5, a middle layer of felsic saprolite with a soil/rock pH of 3.6, and a lower layer of stiff red clay with a soil pH of 4.2.

Despite the relatively low pH values recorded at Location 21, the area exhibited excellent vegetative growth with good root structure and excellent organic surface cover. Based on these field results, clay soil pH values between 4.2 and 5.2 and slightly lower saprolite pH values may be considered representative of background conditions.

3.1.2 Typical Mineralized-Zone Conditions

Soil sampling, as detailed in Appendix A, showed that the sample area generally consists of both felsic (i.e., light colored) and mafic (dark colored) saprolite overlain by one to three feet of brown to red, gravely and sandy red clay. Positive identification of remnant mineralization in the saprolite was, in most cases, impossible due to high degree of weathering.

The pH values of the clay ranged between 2.8 and 7.2 with most values typically between or close to the background levels of 4.2 to 5.2. The higher pH values (i.e., values above 5.5 standard units) were typically observed at the surface and are probably indicative of

lime addition. The lower pH values (i.e., less than four standard units) were typically located in the stockpile and road areas and may be the result of sulfide contamination from previous mining activity.

The pH values of the saprolite were typically lower than the overlying soil, and with one exception, ranged between 2.8 and 5.4 standards units. The one exception was a soil/rock pH of 7.0 at a depth of one foot at Location 14. Due to its relatively shallow depth, the saprolite may have been treated with lime during revegetation activities. In most cases, the relatively low pH values of the saprolite appear to be indicative of natural conditions caused by oxidation of residual pyrite in the rock.

3.1.3 Mining-Related Conditions

Anomalous conditions relating to previous mining activity observed during sampling included:

1. Cobbles, encountered from one to two feet in depth at locations 2, 6, 9 and 11, may be former road and stockpile base material. The pH of this material ranged between 2.6 and 3.7 standard units.
2. A highly-compacted red clay, possibly the clay subliner for the reusable leach pad, was found at Location 19. The clay was underlain by unaltered bedrock which may have been exposed during the initial subgrade preparation for the pad. Given the dense vegetative cover in this area, these subsoil conditions do not appear to be adversely affecting reclamation.
3. Two feet of low-pH mine waste rock was encountered at Location 24 near the toe of a small reclaimed berm area. Despite the low soil pH between 2.2 and 2.7, vegetation in this area is dense.
4. Samples were collected along the former Rainsford haul road at Locations 20, 23 and 26 where revegetation was relatively sparse. The two samples collected at Location 20, Samples 20A and 20B, had soil pH values of 2.8 and 3.0 which may

be indicative of sulfide contamination from former haulage activities. The surface pH values at Locations 23 (6.0) and 26 (5.8) were above background levels; however, the soil was highly compacted and may need to be loosened before attempting to seed the area again. High compaction levels were also apparent at Locations 2 and 5 along the former haul road around the stockpile area.

3.2 AGRICULTURAL SOIL TESTING

The following summary of agricultural soil testing is based on the test results reported by the Clemson Agricultural Service Laboratory (Clemson) in Appendix B. These tests were performed on surface soil samples from the 26-point sample grid and the clay cover borrow material.

Clemson performed soil pH tests in the same manner as was employed at the site, but using deionized water rather than distilled water. Surface soil pH values ranged from 3.0 to 7.3 standard units and were very similar to the reported field pH values. Buffer pH values were then determined by adding a buffer solution with a pH of 8 standard units to the soil/deionized water mixture. The buffer pH, which is used to measure exchangeable acidity in the soil and estimate lime addition requirements, ranged from 5.4 to 7.9 standard units. Other important parameters tested included soil nutrients, cation exchange capacity, acidity, and base saturation. An explanation of these tests is provided in Appendix B.

The majority of the soil, including the clay cover material, was found to need from 2.0 to 2.75 tons of lime addition per acre. The only areas not requiring lime addition for vegetative growth purposes were the former crusher area (Sample Locations 10, 12, 13, 18 and 19) and a portion of the Rainsford haul road (Location 26). These areas were previously identified as having sulfide contamination from crushing and hauling activities and had been heavily treated with lime to prevent the generation of low-pH runoff.

Virtually all of the soil was found to be lacking in phosphorous and potassium. Clemson generally recommended a fertilizer of 60 pounds per acre nitrogen, 100 pounds per acre phosphate (P_2O_5), and 80 pounds per acre potash (K_2O).

3.3 ANP AND AGP TESTING

The following summary of ANP and AGP testing is based on the static test results reported by ColTech EnviroLabs, Inc. (ColTech) in Appendix C. These tests were performed on composite samples from the 26-point sample grid and the clay cover borrow area plus the three bedrock samples. Three duplicate samples were also tested for quality control purposes.

Testing of composite soil samples comprised of equal parts surface, one-foot deep, and two-feet deep samples rather than just surface samples provides a conservative analysis of acid-generating potential. The surface of the Mineralized Zone generally has the lowest pyritic sulfur levels and highest neutralizing potential due to its generally more oxidized state and the periodic application of agricultural lime. This is borne out by the soil pH levels measured in the field which, in most cases, indicate higher pH levels for the surface samples compared to the subsurface samples at the same location (see Appendix A). Although the soils at one and two feet in depth probably contain more pyritic sulfur than the surface samples, they are not expected to generate significant acid drainage because there is substantially less oxygen and water available to fuel the chemical reaction beneath the ground surface as compared to the surface.

For each sample analyzed, ColTech reported total sulfur, pyritic sulfur, unidentified sulfur and sulfate sulfur as a percentage of the soil or rock tested. Pyritic sulfur is of most concern because this material, when oxidized, will generate acid. In contrast, sulfate sulfur has already been oxidized and will not generate acid conditions. Unidentified sulfur typically contains some pyritic sulfur and sulfate sulfur plus organic sulfur which is

tightly bound within the rock chemical matrix and does not readily oxidize. Unidentified sulfur may or may not be of environmental concern depending on the amount of readily oxidizable sulfur present in the unidentified portion.

For each sample, ColTech also reported total sulfur and pyritic sulfur in tons of calcium carbonate (i.e., lime) required to neutralize 1,000 tons of sample and acid neutralizing potential in tons of calcium carbonate available per 1,000 tons of sample for neutralizing acid conditions. For comparison purposes, six-inches of soil over an area of one acre is equivalent to about 1,000 tons of soil. Adding three tons of lime per acre is essentially the same as adding three tons of calcium carbonate (or acid neutralizing potential) per 1,000 tons. Similarly, the addition of three tons of lime per acre would theoretically neutralize the pyritic sulfur represented by three tons of calcium carbonate per 1,000 tons of sample.

The Appendix C results show that the clay cover material (Sample CCD) and the undisturbed soil (Sample 21 D) have a relatively low pyritic sulfur content of 0.03 percent or 0.96 tons of calcium carbonate per 1,000 tons of sample. Their total sulfur content of 0.29 and 0.10 percent (9.28 and 3.20 tons of calcium carbonate per 1,000 tons of sample), respectively, were also relatively low, and their acid neutralizing potential was essentially nil. The absence of acid neutralizing potential is consistent with the type of rock and soil present at the site.

Review of the analytical results for the other soil and rock samples collected in the Mineralized Zone indicates that approximately 2/3rds of the samples have values for pyritic and total sulfur similar to the clay cover borrow and undisturbed areas. Sample locations with elevated pyritic sulfur content include 4 D (0.71%), 10 D (0.57%), 14 D (0.22%), 18 D (0.31%), 24 D (0.74%), 25 D (0.72%). and RCK 3 (1.2%). Sample locations with relatively low pyritic sulfur content but elevated total sulfur content that may be of potential concern include 2 D, 3 D, 8 D, and 20 D. Only samples 10 D, 14 D,

18 D, and 23 D showed any significant acid neutralizing potential, all of which is attributable to the previous addition of agricultural lime.

The three duplicate samples collected, DUP 1, DUP 2, and DUP 3, were of Samples 4 D, CC D, and 25 D, respectively. Correlation between the duplicate sample and original sample was good in each case. ColTech also ran a laboratory duplicate on acid neutralizing potential for Sample 14 D with good correlation.

4.0 SITE EVALUATION AND MITIGATION

The sampling and analytical results presented in Section 3.0 and Appendices A, B, and C are used below to evaluate the Mineralized Zone on an area by area basis. These areas include the upper stockpile and crusher area, the lower crusher area, the reusable pad area, and the Rainsford road area. Mitigation, where needed, is also outlined for each area.

4.1 UPPER STOCKPILE AND CRUSHER AREA

The upper stockpile and crusher area, as represented by Sample Locations 1 through 9 (see Figure 1), consists of a one-half to two-feet-thick layer of clay overlying saprolite and/or former road base material. The area between Sample Locations 6 and 7 consisted of a shallow depression holding standing water that was being backfilled with clay cover at the time of sampling. Sampling and analytical results for individual sample locations include:

Location 1: medium vegetative cover; approximately 18 inches of sandy clay overlying saprolite; soil pH values between 3.7 and 4.6; relatively low buffer pH of 6.8 and base saturation of 22 percent; low pyritic sulfur content of 0.07% and medium unidentified sulfur content of 0.31%.

Location 2: sparse vegetative cover, approximately 9 inches of highly compacted sandy clay overlying cobbles and a lower layer of clayey sand; soil pH values between 2.6 (cobbles) and 5.9 (surface); a buffer pH of 7.3 and a moderate to high base saturation of 86%; low pyritic sulfur content of 0.10% and medium unidentified sulfur content of 0.43%.

Location 3: dense vegetative cover, approximately 18 to 24 inches of clayey sand and sandy clay overlying saprolite; soil pH values between 3.3 and 5.1 (surface); low buffer

pH of 6.2 and low base saturation of 34%; low pyritic sulfur content of 0.12% and high unidentified sulfur content of 1.01%.

Location 4: dense vegetative cover; approximately 16 inches of silt and clay overlying saprolite; soil pH values between 2.8 and 4.1 (surface); buffer pH of 6.9 and base saturation of 61%; high pyritic sulfur content of 0.71% and low unidentified sulfur content of 0.19%.

Location 5: none to sparse vegetative cover (former berm area); approximately 6 inches of compacted sandy clay overlying saprolite; soil pH values between 3.2 and 3.4 (surface); low buffer pH of 5.4 and low base saturation of 18%; low pyritic sulfur content of 0.16% and low unidentified sulfur content of 0.23%.

Location 6: none to medium vegetative cover (spotty); approximately one foot of sandy clay overlying large cobbles (road base material?); soil pH values between 2.8 (cobbles) and 4.3 (surface); buffer pH of 6.7 and base saturation of 50%; low pyritic sulfur content of 0.23% and very high unidentified sulfur content of 1.54%.

Location 7: medium to dense vegetative cover; 18 to 24 inches of clay overlying saprolite; soil pH values between 2.8 (saprolite) and 5.1 (surface); buffer pH of 6.85 and base saturation of 53%; low pyritic sulfur content of 0.03% and low unidentified sulfur content of 0.07%.

Location 8: medium to dense vegetative cover; approximately 18 to 24 inches of sandy clay overlying sandy silt with gravel (stockpile base material?); soil pH values between 3.2 (silt) and 5.4 (surface); buffer pH of 7.05 and base saturation of 49%; low pyritic sulfur content of 0.02% and low unidentified sulfur content of 0.08%.

Location 9: sparse cover of bahia and millet due to seasonal competition with rye grass; approximately 18 to 24 inches of sandy clay overlying gravely silt with cobbles (stockpile

base material?); soil pH values between 3.0 and 4.4 (surface); buffer pH of 6.95 and base saturation of 42%; low pyritic sulfur content of 0.11% and medium unidentified sulfur content of 0.58%.

Area Evaluation - Pyritic sulfur is generally low with the exception of Sample Location 4 D which had a pyritic sulfur equivalent of 22.7 tons of calcium carbonate per 1,000 tons of sample. Most of the unidentified sulfur is attributable to the saprolite and road base material in the subsoil. The imported clay that forms the surface soil is highly compacted in some locations and requires the addition of lime in all locations to increase the buffer pH and base saturation to optimum levels.

Area Mitigation - The current backfilling between Sample Locations 6 and 7 will be extended to the northeast to provide 12 inches of additional clay soil cover at Sample Location 4 and approximately 4 to 6 inches of additional soil cover at Sample Locations 3 and 5. This will serve to mitigate the hot spot detected at Sample Location 4 and increase the soil cover thickness at Sample Locations 3 and 5.

The entire upper area will be harrowed to a depth of approximately 6 inches, bare spots reseeded, lime added at a rate of 3 tons/acre, and 14-24-19 fertilizer added at a rate of 400 lbs/acre. Irrigation will be initiated over the area as soon as possible, and vehicle traffic in the area will be minimized to prevent additional compaction and damage to the vegetation. Periodic mowing of the vegetation will build up the surface organic layer.

Liming and fertilizing will continue on a semiannual basis until the surficial soil exhibits good base saturation and the vegetative cover is consistently medium to dense. At that time, planting of pine trees will further stabilize the area.

4.2 LOWER CRUSHER AREA

The lower crusher area, as represented by Sample Locations 10, 13, 14, 15, 18 and RCK 2 (see Figure 1), consists of 6 to 20 inches of clay and silt overlying saprolite with a rock wall outcropping along the area's east perimeter. The soils in this area were contaminated with sulfide rock by previous crushing and conveying activities and have been excavated and replaced with clay cover in some locations and extensively treated with agricultural lime. Sampling and analytical results for individual sample locations include:

Location 10: none to moderate vegetative cover (spotty); approximately 14 inches of sandy clay overlying saprolite; soil pH values of 5.9 to 7.2; buffer pH of 7.55 and base saturation of 86%; high pyritic sulfur content of 0.57% and high unidentified sulfur content of 0.53%.

Location 13: sparse vegetative cover; approximately 20 inches of sandy clay overlying saprolite and weathered bedrock; soil pH values between 4.1 (surface) and 5.3 (saprolite); buffer pH of 7.3 and base saturation of 70%; low pyritic sulfur content of less than 0.02% and low unidentified sulfur content of 0.06%.

Location 14: medium vegetative cover; approximately 12 inches of sandy silt overlying saprolite; soil pH values between 3.4 (surface) and 7.0 (saprolite); buffer pH of 7.65 and base saturation of 68%; medium pyritic sulfur content of 0.22% and high unidentified sulfur content of 0.61%.

Location 15: sparse vegetative cover (old haul road); approximately 12 inches of sandy clay overlying saprolite and weathered bedrock; soil pH values between 3.4 (bedrock) to 4.6 and 4.8 (surface and saprolite); buffer pH of 7.25 and base saturation of 56%; low pyritic sulfur content of 0.04% and low unidentified sulfur content of 0.05%.

Location 18: sparse and very dry vegetative cover; 6 inches of gravely clay overlying saprolite; soil pH values between 6.8 and 6.9; buffer pH of 7.6 and base saturation of 74%; medium pyritic sulfur content of 0.31% and medium unidentified sulfur content of 0.43%; very high acid neutralization potential of 40.9 tons of calcium carbonate per 1,000 tons (probably due to accumulation of lime in low spot from uphill soil erosion).

RCK 2 Location: The rock wall located in the lower crusher area consists of white platy saprolite with a low pyritic and unidentified sulfur content of less than 0.02%.

Area Evaluation - The soils located in a semicircle through Sample Locations 10, 18 and 14 are sparsely vegetated and contain moderate to high levels of pyritic sulfide. Although treated extensively with lime, these soils will continue to generate acid eventually consuming all of the lime. This is apparent in the surface soil pH values of Locations 10 and 14 which are depressed compared to the subsoil which have not reacted as rapidly due to less contact with oxygen and water. Sample locations 13 and 15 are also sparsely vegetated, probably due to high soil compaction levels and generally dry conditions. The rock wall is not acid generating and does not present an environmental concern.

Area Mitigation – An additional 6 to 12 inches of clay cover will be placed in Locations 10, 18 and 14. Excavation of the existing soils is not necessary (unless required for drainage) because the soils have been extensively treated with lime. SCDHEC has requested, for esthetic purposes, that soil fill be placed against the toe of the rock wall so that the area forms a gradually sloping hillside. This fill work will be performed concurrently with soil placement at Locations 10, 18 and 14.

Once the earthwork is completed, harrowing, seeding, liming, fertilizing, irrigating and mowing will be performed in a similar manner as outlined for the upper crusher and stockpile area. Planting of pine trees will further stabilize the area after the vegetative cover has matured and is well established.

4.3 REUSABLE LEACH PAD AREA

The reusable leach pad area, as represented by Sample Locations 11, 12, 16, 17, 19, and 22 (see Figure 1) consists of 18 to plus 24 inches of silt and clay overlying saprolite and/or bedrock. The lower portion of the soil is typically compacted clay that was originally imported and used as a secondary liner to the former asphalt pad. The asphalt pad was removed and placed in the Permanent Leach Pad landfill except for a small portion of the pad remaining between Sample Locations 16 and 22. The rock outcrop represented by Sample RCK 1 forms a sloped hillside immediately east of the former pad area. Sampling and analytical results for individual sample locations include:

Location 11: medium (and very dry) vegetative cover; plus 24 inches of clayey sand, clayey silt, and gravely silt; soil pH values between 3.7 and 4.4 (surface); buffer pH of 7.2 and base saturation of 46%; low pyritic sulfur content of 0.15% and low unidentified sulfur content of 0.19%.

Location 12: dense vegetative cover; approximately 12 to 18 inches of clay overlying saprolite and weathered bedrock; soil pH values between 4.8 and 6.2 (surface); buffer pH of 7.6 and base saturation of 70%; low pyritic and unidentified sulfur content of less than 0.02%.

Location 16: dense vegetative cover with good organic layer; approximately 18 to 24 inches of clay overlying saprolite; soil pH values between 4.5 (saprolite) and 4.7 (surface); buffer pH of 7.1 and base saturation of 33%; low pyritic and unidentified sulfur contents of 0.02% and 0.03%, respectively.

Location 17: dense vegetative cover with good organic layer; plus 24 inches of clay cover; soil pH values between 4.8 and 5.0; buffer pH of 7.2 and base saturation of 31%; low pyritic and unidentified sulfur content of less than 0.02%.

Location 19: dense vegetative cover; 24 inches of clay overlying bedrock; soil pH values between 4.8 and 5.8 (surface); buffer pH of 7.6 and base saturation of 74 percent; low pyritic and unidentified sulfur contents of 0.02% and 0.08%, respectively.

Location 22: sparse vegetative cover with soil erosion; 18 to 24 inches of clay overlying saprolite; soil pH values between 4.6 (surface) and 5.0; buffer pH of 6.95 and base saturation of 37%; low pyritic and unidentified sulfur content of less than 0.02%.

RCK 1 Location: hillside outcrop of felsic saprolite between the upper crusher area and reusable leach pad; low pyritic and unidentified sulfur content of less than 0.02%.

Area Evaluation - With the exception of Location 22, the reusable leach pad area vegetation looks excellent. Location 22 is a low drainage area that appears to be accumulating sediment from the lower crusher area and Rainsford road. Pyritic and unidentified sulfur is low in all areas include the rock hillside.

Area Mitigation - For aesthetic reasons, the remaining asphalt pad material will be removed. Afterwards, harrowing of the entire area, reseeding of the bare spot at Location 22, applying lime at a rate of 3 tons/acre, and applying 14-24-19 fertilizer at a rate of 400 lbs/acre is recommended. Applying lime and fertilizer at a relatively high rate at this time will most likely eliminate the need for future applications since this area is generally densely vegetated. Irrigation and periodic mowing will also benefit this area.

The rocky hillside east of the pad area blends well with the reclaimed landscape and, given the rock's low sulfur content, no additional reclamation measures are proposed for the hillside. Any attempt to place soil on the hillside would, in all likelihood, be unsuccessful due to sheet-flow runoff eroding away the soil. Planting of pine trees is not recommended for the reusable pad area since the grasses are doing very well.

4.4 RAINSFORD ROAD AREA

The Rainsford road area, as represented by Sample Locations 20, 21, 23, 24, 25, 26 and RCK 3, consists of the former haul road along the top of the Rainsford Pit and the immediate surrounding area. In the immediate road area, approximately 10 to 18 inches of compacted, gravely clay is situated over saprolitic bedrock. The soil in adjacent areas varies considerably as described in the individual sampling and analytical results presented below.

Location 20: sparse vegetation (former road); 10 inches of compacted, gravely clay overlying saprolite; soil pH values of 2.8 and 3.0; buffer pH of 6.95 and base saturation of 52%; low pyritic sulfur content of 0.15% and low unidentified sulfur content of 0.19%.

Location 21: dense vegetative cover; 4 inches of organic silt over 8 inches of clay over 6 inches of saprolite over more clay; intact lithology indicates area undisturbed by mining; pH values between 3.6 (saprolite) and 4.5 (surface); buffer pH of 7.3 and base saturation of 31%; low pyritic sulfur content of 0.03% and low unidentified sulfur content of 0.04%.

Location 23: sparse vegetative cover (former road); 8 to 12 inches of compacted clay overlying saprolite; pH values between 3.7 (felsic saprolite) and 6.0 (surface); buffer pH of 7.0 and base saturation of 79%; low pyritic sulfur content of 0.06% and low unidentified sulfur content of 0.15%.

Location 24: dense vegetative cover; 24 plus inches of silty, mine waste rock; pH values between 2.2 (surface) and 2.7; buffer pH of 7.5 and base saturation of 39%; high pyritic sulfur content of 0.74% and low unidentified sulfur content of 0.09%.

Location 25: dense vegetative cover; 18 to 24 inches of clay overlying a weathered schist containing pyrite; pH values of 3.0 to 4.3 (surface); buffer pH of 6.1 and base saturation

of 22%; high pyritic sulfur content of 0.72% and low unidentified sulfur content of 0.08%.

Location 26: sparse vegetative cover (former road); approximately 18 inches of compacted clay overlying saprolite; pH values between 4.7 (saprolite) and 5.8 (surface); buffer pH of 7.5 and base saturation of 84%; low pyritic sulfur content of 0.04% and low unidentified sulfur content of 0.08%.

RCK 3 Location: flat, weathered bedrock outcropping south of Rainsford road; yellow staining is apparent in some locations; high pyritic sulfur content of 1.2%.

Area Evaluation - Sparse vegetation on the former haul road appears to be primarily attributable to high compaction levels. As previously discussed, Location 21 appears to be representative of the original, undisturbed ground conditions. Location 24 is located near the toe of the reclaimed waste dump and appears to consist of waste rock that was not covered by clay. Although the vegetation is currently very good at Location 24, the near-surface, acid-generating material may adversely affect the vegetation in the future. Location 25 was identified during the previous year as acid-generating and was covered with several feet of clay cover material. The high pyritic sulfur content reported at Location 25 is probably due almost entirely to the pyritic bedrock that is covered with clay. The exposed bedrock at the RCK 3 location is acid generating and presents the greatest environmental concern within this area of the site.

Area Mitigation – Eight to twelve inches of clay cover borrow material be placed over the bedrock outcrop and the lower portion of the Rainsford road (i.e., Location 20 where low soil pH values were reported). Loosening of the soils in the upper portion of the Rainsford road (locations 23 and 26) with a ripper or equivalent method will provide a suitable growth medium in this area.

After the earthwork is completed, the area will be harrowed, re-seeded, limed at 3 tons/acre, and fertilized at 400 lbs. per acre. Similar to other areas, irrigation and periodic mowing will benefit the vegetation and increase the organic matter in the topsoil. Once the area is stabilized and exhibiting good vegetative growth, planting of pine trees along the road and former rock outcrop area will be done on a limited basis. Extensive planting of trees is not recommended for this area because they may eventually encroach upon the clay covers of the Permanent Leach Pad, Rainsford Pit, and reclaimed waste rock dump.

Additional soil sampling and testing of the area around Sample Location 24 will be done to determine how large of an area is affected. Based on previous reclamation activities conducted in this area, the area is believed to be relatively small and will be excavated. No additional sampling or mitigation (other than the application of lime and fertilizer) is proposed for Sample Location 25 as the pyritic bedrock is adequately covered with clay soil and the vegetation in this area is excellent.

FIGURES

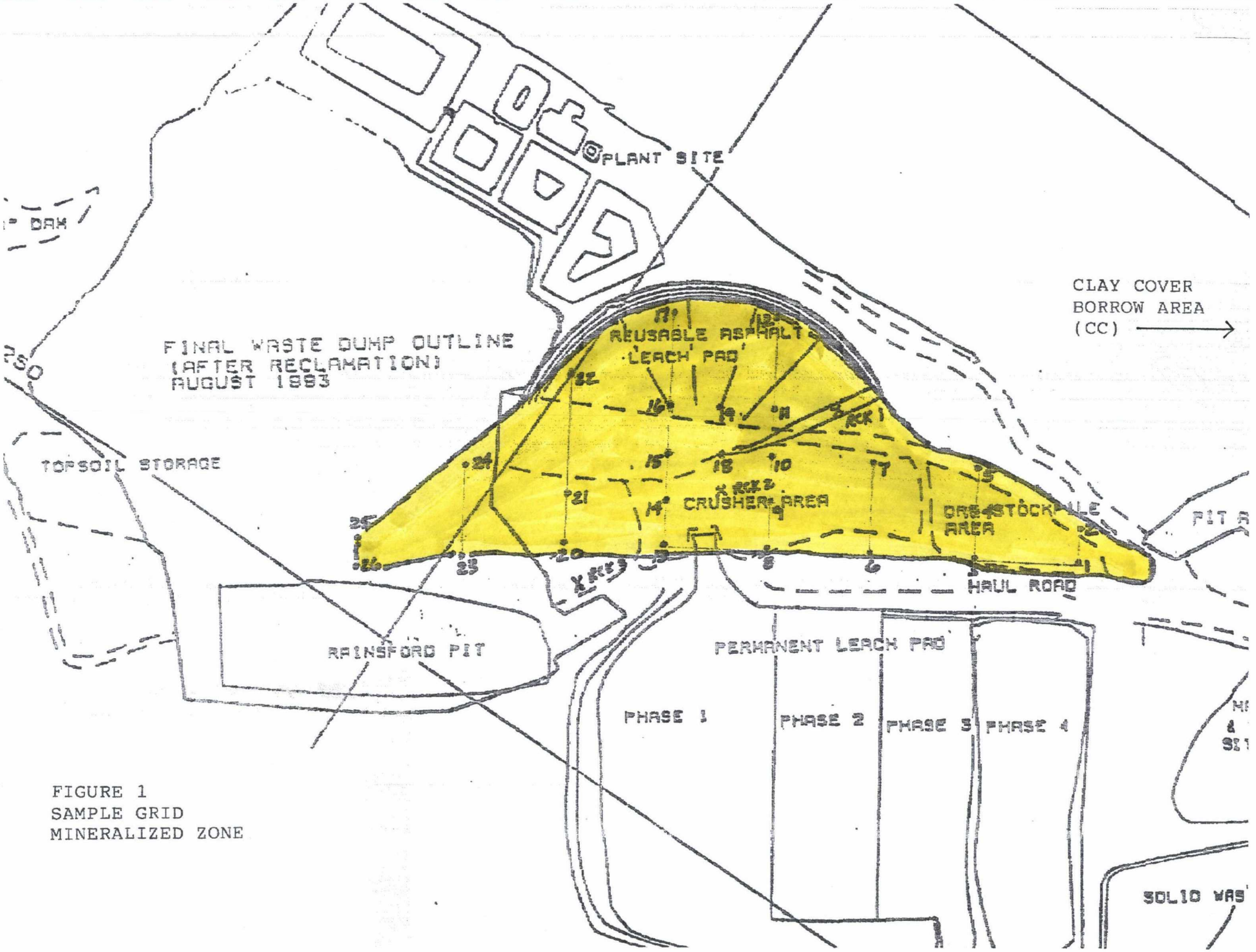

FIGURE 1
SAMPLE GRID
MINERALIZED ZONE

Appendices

NEVADA GOLDFIELDS, INC.
BARITE HILL PROJECT
CONSENT ORDER # 98-049-W
QUARTERLY REPORT - THIRD QUARTER 1998

A sampling and analysis program was initiated during the latter part of August to identify potential contaminant sources and determine appropriate mitigation measures for these sources. A report detailing the program and results of the sampling is attached and is a part of this document. Most of the mitigation work outlined in the report was completed by the end of September. After earthwork in the area was completed the area was plowed to a depth of six to eight inches where possible. Lime and fertilizer were applied following the recommended rates determined by soil analysis.

Thirty- two tons of agriculture lime was spread over the area resulting in an application rate of approximately 2.91 tons of lime per acre. Two and one-half tons of fertilizer (14-24-19) was spread over the area resulting in an application rate of approximately 400 pounds per acre. Summer grasses planted consisted of Pearl Millet at a rate of twenty five to twenty seven pounds per acre. The millet will provide a substantial amount of mulch during fall mowing and increase the organic content of topsoil. Winter grasses planted included rye grass at a rate of fifty to fifty five pounds per acre, winter oat at a rate of thirty-five pounds per acre and winter wheat at a rate of thirty pounds per acre. After the lime, seed and fertilizer were applied; the entire area was plowed again to provide good soil-to-seed contact. One hundred and twenty five bales of straw mulch were spread on slope areas to minimize erosion until the grasses were established. Starting in September, the former ore stockpile area was irrigated using

neutralized pit water. The pit water analysis for the third quarter of 1998 is attached. The following table shows the dates of irrigation and the pH of the water being applied to the area:

Date	pH	Date	pH	Date	pH
9/1/98	8.2	9/2/98	8.8	9/5/98	7.2
9/6/98	8.9	9/7/98	8.8	9/8/98	8.6
9/9/98	8.6	9/10/98	8.7	9/11/98	8.7
9/12/98	8.7	9/13/98	7.2	9/16/98	8.4
9/17/98	7.6	9/18/98	8.9	9/19/98	8.4
9/20/98	7.7	9/21/98	6.5	9/24/98	8.9
9/25/98	8.7	9/26/98	8.6	9/26/98	8.4
9/27/98	8.3	9/28/98	8.3		

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APPENDIX A
SOIL AND ROCK SAMPLING DATA

SOIL SAMPLING
BARITE HILL PROJECT
AUGUST 24 - 26, 1998

Sample Location CC
Vegetation (type and condition) Borrow Area - Not Applicable

Surface Sample I.D. CC A **Soil pH** 4.8
Soil Description brown to red gravely clay (CL)

One-Foot Deep Sample I.D. CC B **Soil pH** 4.7
Soil Description brown to red gravely clay (CL)

Two-Foot Deep Sample I.D. CC C **Soil pH** 5.2
Soil Description yellow to red gravely clay (CL)

Composite Sample I.D. CC D and DUP 2
Soil Description Composite of CC A, CC B, and CC C

Sample Location 1
Vegetation (type and condition) Bahia Grass and Brown Top Millet, medium coverage

Surface Sample I.D. 1A **Soil pH** 3.9
Soil Description red, sandy clay with some gravel (CL)

One-Foot Deep Sample I.D. 1B **Soil pH** 3.7
Soil Description brown to red, sandy clay with some gravel (CL)

Two-Foot Deep Sample I.D. 1C **Soil pH** 4.6
Soil Description light gray to tan saprolite with partially decomposed barite crystals and some red clay

Composite Sample I.D. 1D
Soil Description Composite of 1A, 1B, and 1C

Sample Location 2
Vegetation (type and condition) Bahia Grass and Brown Top Millet, sparse coverage

Surface Sample I.D. 2A **Soil pH** 5.9
Soil Description red, sandy clay with some gravel (CL)

One-Foot Deep Sample I.D. 2B **Soil pH** 2.6
Soil Description cobbles including some sulfide rock (possible road base from previous haul road) with some red clay (GC)

Two-Foot Deep Sample I.D. 2C **Soil pH** 2.8
Soil Description tan to red clayey sand with some gravel (SC)

Composite Sample I.D. 2D
Soil Description Composite of 2A, 2B, and 2C

Sample Location 3
Vegetation (type and condition) Broom Straw and Brown Top Millet, dense coverage

Surface Sample I.D. 3A **Soil pH** 5.1
Soil Description tan to red, clayey sand with organic surface layer (SC)

One-Foot Deep Sample I.D. 3B **Soil pH** 3.3
Soil Description red, fatty clay with some sand (CH)

Two-Foot Deep Sample I.D. 3C **Soil pH** 3.5
Soil Description light gray to tan saprolite

Composite Sample I.D. 3D
Soil Description Composite of 3A, 3B, and 3C

Sample Location 4
Vegetation (type and condition) Bahia Grass, Broom Straw and Brown Top Millet, dense coverage

Surface Sample I.D. 4A **Soil pH** 4.1
Soil Description brown, sandy silt (ML)

One-Foot Deep Sample I.D. 4B **Soil pH** 2.8
Soil Description yellow to red clay with some gravel including sulfide material (CL)

Two-Foot Deep Sample I.D. 4C **Soil pH** 3.3
Soil Description white to yellow, clayey saprolite with partially decomposed sulfide crystals

Composite Sample I.D. 4D
Soil Description Composite of 3A, 3B, and 3C

Sample Location 5
Vegetation (type and condition) Bahia Grass and Brown Top Millet, none to sparse coverage (former berm area)

Surface Sample I.D. 5A **Soil pH** 3.4
Soil Description red, sandy clay with some gravel (CL)

One-Foot Deep Sample I.D. 5B **Soil pH** 3.2
Soil Description white, pink and black felsic saprolite

Composite Sample I.D. 5D
Soil Description Composite of 1A and 1B

Sample Location 6
Vegetation (type and condition) Bahia Grass and Brown Top Millet, none to medium coverage (spotty)

Surface Sample I.D. 6A **Soil pH** 4.3
Soil Description brown to red, sandy clay with some gravel and an organic surficial layer (CL)

One-Foot Deep Sample I.D. 6B **Soil pH** 2.8
Soil Description tan to brown silt with some gravel up to 2 inches in diameter (ML) refusal at 12 inches due to presence of large cobbles (possible road base ?)

Composite Sample I.D. 6D
Soil Description Composite of 6A and 6B

Sample Location 7
Vegetation (type and condition) Broom Straw and Bahia Grass, medium to dense coverage

Surface Sample I.D. 7A **Soil pH** 5.1
Soil Description red clay with some sand and gravel (SC)

One-Foot Deep Sample I.D. 7B **Soil pH** 4.6
Soil Description yellow to red clay with some organic matter (CH)

Two-Foot Deep Sample I.D. 7C **Soil pH** 2.8
Soil Description yellow and pink saprolite with weathered rock fragments up to 12 inches in diameter

Composite Sample I.D. 7D
Soil Description Composite of 7A, 7B, and 7C

Sample Location 8
Vegetation (type and condition) Bahia Grass and Brown Top Millet, medium to dense coverage

Surface Sample I.D. 8A **Soil pH** 5.4
Soil Description red, sandy clay with some gravel and organic matter (CL)

One-Foot Deep Sample I.D. 8B **Soil pH** 4.8
Soil Description yellow and red clay (CH)

Two-Foot Deep Sample I.D. 8C **Soil pH** 3.2
Soil Description yellow and red clay (CH) and a tan, sandy silt with some gravel (ML)

Composite Sample I.D. 8D
Soil Description Composite of 8A, 8B, and 8C

Sample Location 9
Vegetation (type and condition) Bahia Grass, Brown Top Millet and dead rye grass, sparse coverage of Bahia and millet due to seasonal competition with rye

Surface Sample I.D. 9A **Soil pH** 4.4
Soil Description red, sandy clay (CL) with yellow and white inclusions of saprolite

One-Foot Deep Sample I.D. 9B **Soil pH** 3.0
Soil Description red, sandy clay (CL) with some rock fragments (saprolite ?)

Two-Foot Deep Sample I.D. 9C **Soil pH** 3.4
Soil Description light tan to black gravely silt (ML) with cobbles up to 1.5 inches in diameter (stockpile base material ?)

Composite Sample I.D. 9D
Soil Description Composite of 9A, 9B, and 9C

Sample Location 10
Vegetation (type and condition) Bahia Grass, none to moderate coverage (spotty)

Surface Sample I.D. 10A **Soil pH** 5.9
Soil Description brown to red sandy clay with some gravel (CL)

One-Foot Deep Sample I.D. 10B **Soil pH** 7.2
Soil Description brown to red sandy clay (CL) with fragments of white, powdery rock (saprolite)

Composite Sample I.D. 10D
Soil Description Composite of 10A and 10B

Sample Location 11
Vegetation (type and condition) Bahia Grass (very dry), medium coverage

Surface Sample I.D. 11A **Soil pH** 4.4
Soil Description brown clayey sand (SC) with some black and white rock fragments

One-Foot Deep Sample I.D. 11B **Soil pH** 3.7
Soil Description brown clayey silt (CL) with some sand and cobbles (old road base?)

Two-Foot Deep Sample I.D. 11C **Soil pH** 3.7
Soil Description gravely brown silt with fragments of white and pink saprolite

Composite Sample I.D. 11D
Soil Description Composite of 11A, 11B, and 11C

Sample Location 12
Vegetation (type and condition) Bahia Grass and Brown Top Millet, dense coverage

Surface Sample I.D. 12A **Soil pH** 6.2
Soil Description red clayey sand with some gravel up to 0.5 inch in diameter (SC)

One-Foot Deep Sample I.D. 12B **Soil pH** 4.8
Soil Description red to yellow clayey saprolite

Two-Foot Deep Sample I.D. 12C **Soil pH** 4.8
Soil Description refusal at 18 inches at contact with partially weathered bedrock (chip samples taken of light brown and white rock)

Composite Sample I.D. 12D
Soil Description Composite of 12A, 12B, and 12C

Sample Location 13
Vegetation (type and condition) Bahia Grass and Brown Top Millet, sparse coverage

Surface Sample I.D. 13A **Soil pH** 4.1
Soil Description red, sandy clay (CL)

One-Foot Deep Sample I.D. 13B **Soil pH** 4.6
Soil Description yellow clay with some red saprolite stringers

Two-Foot Deep Sample I.D. 13C **Soil pH** 5.3
Soil Description refusal at 20 inches at contact with partially weathered bedrock (chip samples taken of gray to purple-colored rock)

Composite Sample I.D. 13D
Soil Description Composite of 13A, 13B, and 13C

Sample Location 14
Vegetation (type and condition) Bahia Grass and Brown Top Millet, medium coverage

Surface Sample I.D. 14A **Soil pH** 3.4
Soil Description tan sandy silt (ML) with white, yellow and gray platy saprolite

One-Foot Deep Sample I.D. 14B **Soil pH** 7.0
Soil Description tan and pink saprolite

Two-Foot Deep Sample I.D. 14C **Soil pH** 5.4
Soil Description white, pink, yellow and red felsic saprolite

Composite Sample I.D. 14D
Soil Description Composite of 14A, 14B and 14C

Sample Location 15
Vegetation (type and condition) Brown Top Millet and Bahia Grass, sparse coverage (old haul road)

Surface Sample I.D. 15A **Soil pH** 4.6
Soil Description red sandy clay with some gravel (SC) and yellow clayey inclusions

One-Foot Deep Sample I.D. 15B **Soil pH** 4.8
Soil Description yellow and red, platy to tabular saprolite

Two-Foot Deep Sample I.D. 15C **Soil pH** 3.4
Soil Description refusal at 18 inches at contact with weathered bedrock consisting of light purple powdery rock (chip samples taken)

Composite Sample I.D. 15D
Soil Description Composite of 15A, 15B, and 15C

Sample Location 16
Vegetation (type and condition) Bahia Grass and Brown Top Millet, dense coverage with good organic layer on ground surface

Surface Sample I.D. 16A **Soil pH** 4.7
Soil Description red clayey sand (SC)

One-Foot Deep Sample I.D. 16B **Soil pH** 4.7
Soil Description red sandy clay (CL) with fragments of white rock (saprolite?)

Two-Foot Deep Sample I.D. 16C **Soil pH** 4.5
Soil Description pink saprolite

Composite Sample I.D. 16D
Soil Description Composite of 16A, 16B, and 16C

Sample Location 17
Vegetation (type and condition) Bahia Grass and Brown Top Millet, dense coverage with good organic layer on surface

Surface Sample I.D. 17A **Soil pH** 4.8
Soil Description red sandy silt (ML) with some gravel

One-Foot Deep Sample I.D. 17B **Soil pH** 4.9
Soil Description red clay (CL)

Two-Foot Deep Sample I.D. 17C **Soil pH** 5.0
Soil Description red and yellow clay with white rock fragments

Composite Sample I.D. 17D
Soil Description Composite of 17A, 17B, and 17C

Sample Location 18
Vegetation (type and condition) Bahia Grass and Brown Top Millet, sparse (and very dry) coverage

Surface Sample I.D. 18A **Soil pH** 6.9
Soil Description brown to red sandy silt with some gravel (ML)

One-Foot Deep Sample I.D. 18B **Soil pH** 6.8
Soil Description refusal at 6 inches (white to pink weathered, felsic bedrock samples collected)

Composite Sample I.D. 18D
Soil Description Composite of 18A and 18B

Sample Location 19
Vegetation (type and condition) Bahia Grass, Brown Top Millet, Broom Straw and lespedeza, dense coverage

Surface Sample I.D. 19A **Soil pH** 5.8
Soil Description sandy, gravely red clay (CL)

One-Foot Deep Sample I.D. 19B **Soil pH** 5.0
Soil Description highly indurated red clay (CH), possibly the underliner for the former reusable heap leach pad

Two-Foot Deep Sample I.D. 19C **Soil pH** 4.8
Soil Description refusal at 24 inches in unaltered bedrock, samples of overlying brown clay (CH) were taken

Composite Sample I.D. 19D
Soil Description Composite of 19A, 19B and 19C

Sample Location 20
Vegetation (type and condition) Brown Top Millet and Bahia Grass, sparse (former Rainsford Pit haul road)

Surface Sample I.D. 20A **Soil pH** 2.8
Soil Description brown, gravely clay (CL)

One-Foot Deep Sample I.D. 20B **Soil pH** 3.0
Soil Description yellow, white and purple-colored, platy to tabular saprolite

Composite Sample I.D. 20D
Soil Description Composite of 20A and 20B

Sample Location 21
Vegetation (type and condition) Bahia Grass and Brown Top Millet, dense coverage with good organic layer on ground surface

Surface Sample I.D. 21A **Soil pH** 4.5
Soil Description top 4 inches = brown silt (ML) with substantial roots and other organic material, soil horizons appear to be representative of original, undisturbed conditions

One-Foot Deep Sample I.D. 21B **Soil pH** 3.6
Soil Description from 12 to 18 inches, highly altered, white, pink, yellow and red saprolite

Two-Foot Deep Sample I.D. 21C **Soil pH** 4.2
Soil Description stiff red clay (CL)

Composite Sample I.D. 21D
Soil Description Composite of 21A, 21B, and 21C

Sample Location 22
Vegetation (type and condition) Bahia Grass and Brown Top Millet, sparse with soil erosion

Surface Sample I.D. 22A **Soil pH** 4.6
Soil Description red gravely clay (CL)

One-Foot Deep Sample I.D. 22B **Soil pH** 4.7
Soil Description red sandy clay (CL) with some gravel

Two-Foot Deep Sample I.D. 22C **Soil pH** 5.0
Soil Description tan to red clayey saprolite

Composite Sample I.D. 22D
Soil Description Composite of 22A, 22B, and 22C

Sample Location 23
Vegetation (type and condition) Bahia Grass and Brown Top Millet, sparse coverage (former Rainsford haul road)

Surface Sample I.D. 23A **Soil pH** 6.0
Soil Description red clay (CL) with some white rock fragments (saprolite?)

One-Foot Deep Sample I.D. 23B **Soil pH** 3.7
Soil Description white saprolite with inclusions of red and yellow clay

Two-Foot Deep Sample I.D. 23C **Soil pH** 5.2
Soil Description dark green and black saprolite (highly weathered schist?)

Composite Sample I.D. 23D
Soil Description Composite of 23A, 23B, and 23C

Sample Location 24
Vegetation (type and condition) Bahia Grass, Brown Top Millet, sericea (appalow), dense coverage

Surface Sample I.D. 24A **Soil pH** 2.2
Soil Description brown silt with pink and purple gravel and cobbles (ML), appears to be mine waste rock

One-Foot Deep Sample I.D. 24B **Soil pH** 2.7
Soil Description brown silt with pink and purple gravel and cobbles (ML), appears to be mine waste rock

Two-Foot Deep Sample I.D. 24C **Soil pH** 2.6
Soil Description brown silt with tan-colored gravel and cobbles (ML), appears to be mine waste rock

Composite Sample I.D.
Soil Description Composite of 24A, 24B and 24C

Sample Location 25
Vegetation (type and condition) Bahia Grass, lespedeza, sericea (appalow), Brown Top Millet, dense coverage

Surface Sample I.D. 25A **Soil pH** 4.3
Soil Description brown gravely clay (CL)

One-Foot Deep Sample I.D. 25B **Soil pH** 3.0
Soil Description red clay with inclusions of yellow clay (CL)

Two-Foot Deep Sample I.D. 25C **Soil pH** 3.5
Soil Description brown saprolite and black and white schist with flecks (1 mm diameter) of pyrite

Composite Sample I.D. 25D and DUP 3
Soil Description Composite of 25A, 25B and 25C

Sample Location 26
Vegetation (type and condition) Bahia Grass, sparse coverage (former Rainsford haul road)

Surface Sample I.D. 26A **Soil pH** 5.8
Soil Description brown clayey gravel (GC)

One-Foot Deep Sample I.D. 26B **Soil pH** 4.8
Soil Description red and yellow clay (CL)

Two-Foot Deep Sample I.D. 26C **Soil pH** 4.7
Soil Description red and yellow saprolite

Composite Sample I.D. 26D
Soil Description Composite of 26A, 26B, and 26C

ROCK SAMPLING
BARITE HILL PROJECT
AUGUST 24 - 26, 1998

Sample Location Low hillside northeast of former reusable pad and crusher area and immediately south of plant access road

Sample I.D. RCK 1

Rock Description brownish-red, pink, white, and yellowish-white, platy, felsic, saprolite; small dissolution cavities (less than 1 mm in diameter) and microscopic mineralization (possibly barite and mica crystals) are evident in some areas

Sample Location highwall in crusher area

Sample I.D. RCK 2

Rock Description white, very soft, friable and platy saprolite; some areas have a mica-like sheen, but no mineralization is evident

Sample Location former ramp to Rainsford Pit (northwest of Permanent Leach Pad)

Sample I.D. RCK 3

Rock Description white to light pink and dark, reddish brown platy weathered bedrock; the lighter colored rock has small dissolution cavities (less than 1 mm in diameter); the darker colored rock contains microscopic mineralization and dark yellow staining in some areas

APPENDIX B
AGRICULTURAL TEST RESULTS

Major Divisions			Graphic Symbols		Typical Name	Field Identification Procedures (Excluding particles larger than 3 in. and basing fractions on estimated weights)			Information Required for Describing Soils
1	2		3	3a	4	5			6
Coarse-Grained Soils More than half of material is larger than No. 200 sieve size. The No. 200 sieve size is about the smallest particle visible to the naked eye.	Gravels More than half of coarse fraction is larger than No. 4 sieve size (For visual classification, the 1/4 in. size may be used as equivalent to the No. 4 sieve size)	Clean Gravels (Little or no fines)	GW	RED	Well-graded gravels, gravel-sand mixtures, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.			For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions, and drainage characteristics. Give typical name; indicate approximate percentages of sand and gravel, maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbol in parentheses. Example: Silty sand, gravelly; about 20% hard, angular gravel particles 1/2-in. maximum size; rounded and subangular sand grains, coarse to fine; about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM).
			GP		Poorly graded gravels or gravel-sand mixtures, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			
		Gravels with Fines (Appreciable amount of fines)	GM	YELLOW	Silty gravels, gravel-sand-silt mixture.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).			
			GC		Clayey gravels, gravel-sand-clay mixtures.	Plastic fines (for identification procedures see CL below).			
	Sands More than half of coarse fraction is smaller than No. 4 sieve size (For visual classification, the 1/4 in. size may be used as equivalent to the No. 4 sieve size)	Clean Sands (Little or no fines)	SW	RED	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.			
			SP		Poorly graded sands or gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			
		Sands with Fines (Appreciable amount of fines)	SM	YELLOW	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).			
			SC		Clayey sands, sand-clay mixtures.	Plastic fines (for identification procedures see CL below).			
						Identification Procedures On Fraction Smaller than No. 40 Sieve Size			
						Dry Strength (Crushing Characteristics)	Dilatancy (Reaction to Shaking)	Toughness (Consistency near PL)	
Fine-Grained Soils More than half of material is smaller than No. 200 sieve size. The No. 200 sieve size is about the smallest particle visible to the naked eye.	Silts and Clays Liquid limit is less than 50		ML	GREEN	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	None to slight	Quick to slow	None	For undisturbed soils add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions. Give typical name; indicate degree and character of plasticity; amount and maximum size of coarse grains; color in wet condition; odor, if any; local or geologic name and other pertinent descriptive information; and symbol in parentheses. Example: Clayey silt, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (ML).
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high	None to very slow	Medium	
			OL		Organic silts and organic silty clays of low plasticity.	Slight to medium	Slow	Slight	
	Silts and Clays Liquid limit is greater than 50		MH	BLUE	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Slight to medium	Slow to none	Slight to medium	
			CH		Inorganic clays of high plasticity, fat clays.	High to very high	None	High	
			OH		Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium	
Highly Organic Soils			Pt	ORANGE	Peat and other highly organic soils.	Readily identified by color, odor, spongy feel and frequently by fibrous texture.			

Laboratory Classification Criteria

Use grain-size curve in identifying the fractions as given under field identification.

Determine percentages of gravel and sand from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows:

Less than 5% = GW, GP, SW, SP
More than 12% = GM, GC, SM, SC
5% to 12% = Borderline cases requiring use of dual symbols

$C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $\qquad C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3

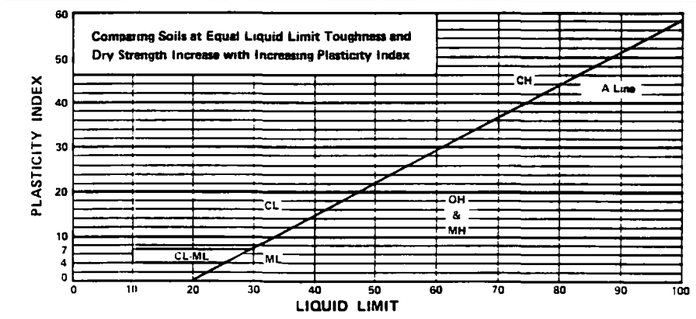
Not meeting all gradation requirements for GW

Atterberg limits below "A" line or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols.
Atterberg limits above "A" line with PI greater than 7	

$C_u = \frac{D_{60}}{D_{10}}$ Greater than 6 $\qquad C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3

Not meeting all gradation requirements for SW

Atterberg limits below "A" line or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols.
Atterberg limits above "A" line with PI greater than 7	



PLASTICITY CHART

For laboratory classification of fine-grained soils

(1) Boundary classifications: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well-graded gravel-sand mixture with clay binder. (2) All sieve sizes on this chart are U.S. standard.

Unified Soil Classification System

TABLE 1

CLEMSON EXTENSION

Agricultural Service Laboratory

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SOIL ANALYSIS REPORT

DATE: 09/02/98

THIS REPORT IS FOR:

WILKINSON, SCOTT A
NEVADA GOLDFIELDS
P O BOX 1530
MCCORMICK, SC 29835

COPY TO:

COUNTY OR DEPARTMENT: **MCCORMICK**

GUIDE TO RATING CODES:

VL=Very Low, L=Low, M=Medium, H=High, VH=Very High
S=Sufficient, I=Insufficient

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801572	1A	4	3.6	6.80	0 VL	18 VL	362 L+	119 H	4.6 S	102 S	31.3	0.4

CEC	ACIDITY	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
(meq/100g)		Ca	Mg	K	Na	TOTAL			
6.3	4.8	14	8	0	0	22			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	2.75	60	100	80	2,40,62,65
Temp. Annual Grazing, Summer	2.75	60	100	80	2,39,62,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801573	2A	4	5.7	7.30	0 VL	99 M	6476 VH	367 H	6.4 S	256 S	52.0	0.5

CEC	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
20.7	2.8	78	7	1	0	86			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	1.25	60	100	40	40,62,65
Temp. Annual Grazing, Summer	1.25	60	100	40	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801574	3A	4	4.9	6.20	0 VL	55 L+	809 H-	325 H	1.4 I	147 S	3.7	0.8

CEC	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
10.7	7.2	19	13	1	1	34			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.50	60	100	80	40,64,65
Temp. Annual Grazing, Summer	2.50	60	100	80	39,64,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801575	4A	4	4.3	6.90	0 VL	27 L	2118 VH	416 H	16.1 S	94 S	131	0.1

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
11.5	4.4	46	15	0	0	61			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	2.75	60	100	80	40,62,65
Temp. Annual Grazing, Summer	2.75	60	100	80	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801576	5A	4	3.0	5.40	0 VL	5 VL	566 M	229 H	11.5 S	211 S	94.1	0.2

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
12.8	10.4	11	7	0	0	18			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	2.75	60	100	80	40,62,65
Temp. Annual Grazing, Summer	2.75	60	100	80	39,62,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801577	6A	4	4.0	6.70	0 VL	40 L	1401 H	339 H	5.8 S	614 S	52.7	0.6

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
10.2	5.2	34	14	1	1	50			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.75	60	100	80	40,62,65
Temp. Annual Grazing, Summer	2.75	60	100	80	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801578	7A	4	4.9	6.85	1 VL	84 M-	1156 H-	533 H	1.1 I	60 S	2.7	0.9

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
9.9	4.6	29	22	1	1	53			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.50	60	100	40	40,64,65
Temp. Annual Grazing, Summer	2.50	60	100	40	39,64,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801579	8A	4	5.2	7.05	0 VL	29 L	699 M+	404 H	1.6 S	54 S	2.6	0.8

CEC (meq/100g)	ACIDITY	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
7.3	3.8	24	23	1	1	49			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.00	60	100	80	40,62,65
Temp. Annual Grazing, Summer	2.00	60	100	80	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801581	9A	4	4.3	6.95	0 VL	35 L	647 M	296 H	1.9 S	221 S	4.8	0.6

CEC (meq/100g)	ACIDITY	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
7.1	4.2	23	17	1	1	42			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.75	60	100	80	40,62,65
Temp. Annual Grazing, Summer	2.75	60	100	80	39,62,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801582	10A	4	6.4	7.55	0 VL	53 L+	4269 VH	76 M	3.3 S	41 S	44.0	0.5

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
12.9	1.8	83	2	1	0	86			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	0.00	60	100	80	40,62,65
Temp. Annual Grazing, Summer	0.00	60	100	80	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801583	11A	4	4.7	7.20	8 L	90 M-	644 M	230 H	3.4 S	20 S	26.3	0.5

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
5.9	3.2	27	16	2	1	46			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.00	60	80	40	40,62,65
Temp. Annual Grazing, Summer	2.00	60	80	40	39,62,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801586	14A	4	5.2	7.65	5 VL	14 VL	720 M+	274 H	21.0 S	62 S	34.2	0.5

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
4.5	1.4	40	25	0	3	68			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	0.75	60	100	80	40,62,65
Temp. Annual Grazing, Summer	0.75	60	100	80	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801587	15A	4	5.4	7.25	1 VL	44 L	1033 H-	237 H	2.5 S	8 S	5.3	0.7

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
6.8	3.0	38	15	1	2	56			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	1.50	60	100	80	40,62,65
Temp. Annual Grazing, Summer	1.50	60	100	80	39,62,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801588	16A	4	5.1	7.10	0 VL	68 L+	437 M-	126 H	1.1 I	7 S	2.1	0.7

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
5.4	3.6	20	10	2	1	33			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.00	60	100	80	40,64,65
Temp. Annual Grazing, Summer	2.00	60	100	80	39,64,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801589	17A	4	4.5	7.20	2 VL	40 L	356 L+	105 H	1.1 I	19 S	6.7	0.7

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
4.7	3.2	19	9	1	2	31			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.25	60	100	80	2,40,64,65
Temp. Annual Grazing, Summer	2.25	60	100	80	2,39,64,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801590	18A	4	7.3	7.90	19 L+	196 H	6402 VH	386 H	9.0 S	16 S	26.2	0.8

CEC	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER(%)	NO3-N (ppm)
18.4	0.4	87	9	1	1	98			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	0.00	60	80	0	8,40,62,65
Temp. Annual Grazing, Summer	0.00	60	80	0	8,39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801591	19A	4	5.8	7.60	6 VL	58 L+	1135 H-	362 H	2.3 S	14 S	7.9	0.8

CEC	ACIDITY (meq/100g)	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER(%)	NO3-N (ppm)
6.1	1.6	47	25	1	1	74			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	0.00	60	100	80	40,62,65
Temp. Annual Grazing, Summer	0.00	60	100	80	39,62,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801592	20A	4	4.1	6.95	0 VL	8 VL	1226 H	358 H	9.1 S	15 S	26.8	0.1

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
8.8	4.2	35	17	0	0	52			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.75	60	100	80	40,62,65
Temp. Annual Grazing, Summer	2.75	60	100	80	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801593	21A	4	4.6	7.30	0 VL	39 L	343 L+	78 M	1.3 I	58 S	9.4	0.8

CEC (meq/100g)	ACIDITY (meq/100g)	% BASE SATURATION					S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
		Ca	Mg	K	Na	TOTAL			
4.1	2.8	21	8	1	1	31			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	2.00	60	100	80	2,40,64,65
Temp. Annual Grazing, Summer	2.00	60	100	80	2,39,64,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801594	22A	4	4.8	6.95	1 VL	50 L+	560 M	222 H	0.8 I	4 I	1.7	1.0

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
6.6	4.2	21	14	1	1	37			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	2.50	60	100	80	40,64,67,69
Temp. Annual Grazing, Summer	2.50	60	100	80	39,64,67,69

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801595	23A	4	5.6	7.00	0 VL	32 L	5480 VH	320 H	3.6 S	79 S	34.2	0.8

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
19.1	4.0	72	7	0	0	79			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	1.75	60	100	80	40,62,65
Temp. Annual Grazing, Summer	1.75	60	100	80	39,62,65

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WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801596	24A	4	3.3	7.50	0 VL	4 VL	273 L	131 H	1.9 S	19 S	5.6	0.3

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
3.3	2.0	21	17	0	1	39			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	1.50	60	100	80	2,40,62,65
Temp. Annual Grazing, Summer	1.50	60	100	80	2,39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801597	25A	4	4.5	6.10	0 VL	95 M-	647 M	117 H	3.3 S	207 S	16.4	1.0

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
9.9	7.6	16	5	1	0	22			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	2.75	60	100	40	40,62,65
Temp. Annual Grazing, Summer	2.75	60	100	40	39,62,65

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RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801598	26A	4	6.1	7.50	5 VL	165 H-	3013 VH	597 H	5.9 S	44 S	7.0	0.8

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
12.3	2.0	61	20	2	1	84			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	0.00	60	100	0	8,40,62,65
Temp. Annual Grazing, Summer	0.00	60	100	0	8,39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A)							
					P	K	Ca	Mg	Zn	Mn	Cu	B
0801599	CCA	4	4.9	6.75	0 VL	47 L	552 M	177 H	2.0 S	143 S	9.0	0.7

CEC	ACIDITY	% BASE SATURATION					S	ORGANIC	NO3-N
(meq/100g)		Ca	Mg	K	Na	TOTAL	(lb/A)	MATTER(%)	(ppm)
7.2	5.0	19	10	1	1	31			

RECOMMENDATIONS

CROP	LIME	FERTILIZER			SEE COMMENTS
	T/A	N lb/A	P205 lb/A	K20 lb/A	
Temp. Annual Grazing, Winter	2.50	60	100	80	40,62,65
Temp. Annual Grazing, Summer	2.50	60	100	80	39,62,65

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WILKINSON, SCOTT A (cont.)

COMMENTS

2 Soil acidity and low calcium can be corrected with dolomitic or calcitic limestone at the recommended rate.

8 When no phosphorus and/or potassium is recommended and none is applied, sample again next year.

39 Apply N, P, and K as recommended before growth begins. Apply 60 pounds of nitrogen per acre each time forage is grazed down or hay is cut.

40 For small grain or ryegrass planted for grazing on fallowed fields in early September, apply 100 pounds of nitrogen per acre at planting and 60 pounds per acre in early spring.

62 Test for zinc indicates there is sufficient zinc in the soil for good plant growth.

64 Test for zinc indicates the level in the soil is (I) Insufficient. Use Plant analysis and foliar spray if plant analysis indicates the level in the plant is insufficient.

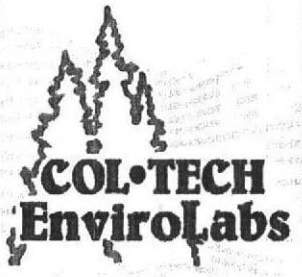
65 Test for manganese indicates there is sufficient manganese in the soil for good plant growth.

67 Test for manganese indicates the level in the soil is (I) Insuffcient. Use plant analysis and foliar spray if plant analysis indicates the level in the plant is insufficient.

69 If manganese deficiency symptoms occur and this is confirmed by a plant analysis, manganese may be applied as a foliar spray either singularly or mixed with a pesticide. Make one or two applications of 1 or 2 pounds of elemental manganese per acre.

If you have any questions, please contact your county extension office. The phone number is **(864)465-2112**.

APPENDIX C
ANP/AGP TEST RESULTS



STATIC TESTS

For

ATTN: Mr. Scott Wilkinson

Nevada Goldfields, Inc.

Laboratory Number: M244-02
Invoice Number: M0311

Date: September 15, 1998

COL•TECH EnviroLabs
855 Mill Street, Suite 1 B Reno, Nevada 89502 PH 800 774 3636, 702 331 3600, FAX 702 323 8253

STATIC TEST

SAMPLE	Total Sulfur (as S)	Pyritic Sulfur (as S)	Sulfur, Unidentified (as S)	Sulfate Sulfur	Total Sulfur	Pyritic Sulfur	Acid Neutralizing Potential
ID:	%	%	%	%	Tons $CaCo_3$/Kt	Tons $CaCo_3$/Kt	Tons $CaCo_3$/Kt
CCD	0.29	0.03	0.19	0.07	9.28	0.96	* - 0 -
RCK 1	0.06	<0.02	<0.02	<0.02	1.92	<0.64	* - 0 -
RCK 2	0.05	<0.02	<0.02	<0.02	1.60	<0.64	3.1
RCK 3	1.42	1.20	0.04	0.18	45.4	38.4	* - 0 -
DUP 1	1.01	0.64	0.13	0.24	32.3	20.5	* - 0 -
DUP 2	0.21	0.04	0.17	<0.02	6.72	1.28	1.9
DUP 3	1.19	1.02	0.08	0.09	38.1	32.6	* - 0 -
1 D	0.47	0.07	0.31	0.09	15.0	2.24	* - 0 -
2 D	0.83	0.10	0.43	0.30	26.6	3.20	* - 0 -
3 D	1.28	0.12	1.01	0.15	41.0	3.84	* - 0 -
4 D	1.21	0.71	0.19	0.31	38.7	22.7	1.0
5 D	0.57	0.16	0.23	0.19	18.2	5.12	* - 0 -
6 D	1.89	0.23	1.54	0.12	60.5	7.36	* - 0 -
7 D	0.17	0.03	0.07	0.07	5.44	0.96	* - 0 -
8 D	0.18	0.02	0.08	0.08	5.76	0.64	* - 0 -
9 D	0.84	0.11	0.58	0.15	3.52	3.52	* - 0 -
10 D	1.36	0.57	0.53	0.26	43.5	18.2	7.1

***This sample is acid generating.**

Wayne M. Colwell
General Manager

NDEP STATIC TEST
Company: Nevada Goldfields, Inc.
Laboratory Number: M244-02
Invoice Number: M0311

Date: September 15, 1998

STATIC TEST

SAMPLE	Total Sulfur (as S)	Pyritic Sulfur (as S)	Sulfur, Unidentified (as S)	Sulfate Sulfur	Total Sulfur	Pyritic Sulfur	Acid Neutralizing Potential
ID:	%	%	%	%	Tons $CaCo_3$/Kt	Tons $CaCo_3$/Kt	Tons $CaCo_3$/Kt
11 D	0.38	0.15	0.19	0.04	12.2	4.80	* - 0 -
12 D	0.05	<0.02	<0.02	<0.02	1.60	<0.64	1.6
13 D	0.10	<0.02	0.06	0.04	3.20	<0.64	1.0
14 D	0.85	0.22	0.61	0.02	27.2	7.04	5.5
14D Dupe							5.8
15 D	0.12	0.04	0.05	0.03	3.84	1.28	1.9
16 D	0.08	0.02	0.03	0.03	2.56	0.64	2.8
17 D	0.06	<0.02	<0.02	<0.02	1.92	<0.64	<0.5
18 D	0.93	0.31	0.43	0.19	29.8	9.92	40.9
19 D	0.18	0.02	0.08	0.08	5.76	0.64	1.0
20 D	0.43	0.15	0.19	0.19	13.8	4.30	* - 0 -
21 D	0.10	0.03	0.04	0.03	3.20	0.96	* - 0 -
22 D	0.09	<0.02	<0.02	<0.02	2.88	<0.64	* - 0 -
23 D	0.32	0.06	0.15	0.11	10.2	1.92	8.85
24 D	0.94	0.74	0.09	0.11	30.1	23.7	* - 0 -
25 D	0.84	0.72	0.08	0.04	26.9	23.0	* - 0 -
26 D	0.21	0.04	0.08	0.09	6.72	1.28	1.3

***This sample is acid generating.**

Wayne M. Colwell
General Manager

COL•TECH EnviroLabs, Inc.
1855 Deming Way, Sparks, Nevada 89431 PH 800 774 3636, 702 331 3600, FAX 702 331 7264

CLEMSON EXTENSION

Agricultural Service Laboratory

171 Old Cherry Road, Box 340313 • Clemson, SC 29634-0313
Phone: 864.656.2068 Fax: 864.656.2069 agsrvlb@clemson.edu

WILKINSON, SCOTT A (cont.)

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801584	12A	4	6.3	7.60	19 L+	90 M-	1711 H+	509 H	4.3 S	10 S	1.8	0.7

CEC	ACIDITY	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
(meq/100g)									
8.2	1.6	52	26	1	1	80			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	0.00	60	80	40	40,62,65
Temp. Annual Grazing, Summer	0.00	60	80	40	39,62,65

RESULTS

LAB NO.	SAMPLE NO.	SOIL CODE	SOIL pH	BUFFER pH	SOIL TEST RESULTS (lb/A) P	K	Ca	Mg	Zn	Mn	Cu	B
0801585	13A	4	6.0	7.30	0 VL	42 L	1858 H+	433 H	3.1 S	7 S	3.3	0.7

CEC	ACIDITY	% BASE SATURATION Ca	Mg	K	Na	TOTAL	S (lb/A)	ORGANIC MATTER (%)	NO3-N (ppm)
(meq/100g)									
9.4	2.8	49	19	1	1	70			

RECOMMENDATIONS

CROP	LIME T/A	FERTILIZER N lb/A	P205 lb/A	K20 lb/A	SEE COMMENTS
Temp. Annual Grazing, Winter	0.00	60	100	80	40,62,65
Temp. Annual Grazing, Summer	0.00	60	100	80	39,62,65